ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	DORMA Deutschland GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20150184-IBB1-EN
Issue date	04.11.2015
Valid to	03.11.2020

ITS 96 System and TS 97

DORMA Deutschland GmbH

Institut Bauen und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com

1. General Information

DORMA Deutschland GmbH	ITS 96 System and TS97
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** DORMA Deutschland GmbH DORMA Platz 1 58256 Ennepetal
Declaration number EPD-DOR-20150184-IBB1-EN	**Declared product / Declared unit** The declared unit represents one (1) average slide channel door closer. Two models of the ITS 96 series and one model of the TS 97 series are reviewed in order to obtain average values. The average was established from the weights relating to volumes of the variants sold.
This Declaration is based on the Product Category Rules: Locks and fittings , 07.2014 (PCR tested and approved by the SVR)	**Scope:** This EPD is based on the entire life cycle of an average ITS 96 and TS 97 door closer manufactured by DORMA. The various technical features are outlined in section 2.3. The products are manufactured at the DORMA production facility in Ennepetal, Germany. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Issue date 04.11.2015	
Valid to 03.11.2020	**Verification** The CEN Norm /EN 15804/ serves as the core PCR Independent verification of the declaration according to /ISO 14025/ ☐ internally ☒ externally
Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)	
Dr. Burkhart Lehmann (Managing Director IBU)	Dr.-Ing. Wolfram Trinius (Independent verifier appointed by SVR)

2. Product

2.1 Product description

Within the framework of this EPD, an average slide channel door closer system is declared, based on two models of the integrated ITS 96 door closer series, as averages relating to the product aspects:

- EN 2-4 / ANSI 1-3
- EN 3-6 / ANSI 2-5

and one variant of the TS 97 EN 2-4 surface-mounted door closer.

ITS 96 system

The integrated ITS 96 slide channel door closer system is a modular and multifunctional system comprising only with a few door closer models and various slide channels which complies with many functional requirements. Therefore, it is possible to equip doors for a wide variety of applications and in various door situations. Due to the concealed installation of the closer and slide channel, the system is not perceived by the user and therefore offers both visual advantages and protection against vandalism.

TS 97

Unlike the integrated door closers, the TS 97 slide channel door closer model is surface-mounted. The body of the TS 97 is flush with the slide channel and the single-piece face plate reveals neither slots nor fixing points. The end caps are internal and all gap dimensions are extremely reduced.
Visual design options arise from a variety of surface finishes available. The functions of the TS 97 can be adapted individually to the respective door situation and co-ordinated to various requirements.

2.2 Application

ITS 96 system

The DORMA integrated door closers ITS 96 system can be used universally. Depending on the accessories, the closers can be used on single- or double-leaf fire and smoke check doors provided that a form of verification associated with the respective fire and smoke check door is available. This also applies for use on doors without requirements. Thanks to its compact design, the ITS 96 system can be installed in all doors with a leaf thickness of 40 mm or more. The functions of the ITS 96 system can be individually co-ordinated to the respective door situation and local

conditions. The closing force can be easily varied in accordance with the door width via the adjustment screw accessible from the top. The closing speed and end stop (not for the 2S version) can also be adjusted from the top at any time – even when installed. The requirements to barrier-free building in accordance with /DIN 18040/ and /CEN/TR 15894/ are complied with by the ITS 96 system.

TS 97

The surface-mounted TS 97 slide channel door closer can be used on single-leaf fire and smoke check doors provided that a form of verification associated with the respective fire and smoke check door is available. This also applies for use on doors without requirements. The requirements on barrier-free building in accordance with /DIN 18040/ and /CEN/TR 15894/ are also complied with by the TS 97.
The TS 97 closing speed and end stop are infinitely variable via valve. The TS 97 closing force is adjustable variable between EN 2–4, i.e. up to a door width of 1,100 mm. The integral mechanical cushioned limit stay of the TS 97 features progressive damping and helps to prevent a normally opened door from colliding with the adjacent wall caused by opening too wide. It can be adjusted to an opening angle of between 80° and max. 120°. Depending on the respective application, it is also possible to secure the TS 97 to all-glass doors using a glass saddle plate.

2.3 Technical Data

Data and features		ITS 96	
Variable closing force	Spring strength	EN 2–4	EN 3–6
Standard doors[1]	up to 1100 mm	●	●
	up to 1400 mm	–	●
External doors, outward opening		–	–
Fire and smoke check doors[1]	up to 1100 mm	●	●
	up to 1400 mm	–	●
Door leaf thickness	up to 40 mm	●	–
	up to 50 mm	●	●
Max. door leaf weight in kg		130	180
Non-handed design (closer)		●	●
Arm	Slide channel	●	●
Closing force variable by means of adjustable screw		●	●
Closing speed adjustable by means of valve		●	●
Latching speed adjustable by means of valve		●	●
Cushioned limit stay, mechanical		●	●
Delayed action		–	–
Hold-open		○	○
Max. door opening angle (depends on door design)		approx. 120°	
Input voltage		–	–
Power consumption		–	–
Weight in kg		1.3	2.5
Dimensions in mm	Length	277	291
	Width	32	39.5
	Height	42	51
Door closer tested to EN 1154		●	
Hold-open devices tested to EN 1155		●	
Door co-ordinators tested to EN 1158		●	
CE mark for building products		●	
Suitable for barrier-free building to DIN 18040 and DIN SPEC 1104 (CEN/TR 15894)		●	
ANSI 156.4		●	

● Yes – No ○ Option

1) For applications involving particularly heavy or wide doors, and doors which have to close against wind resistance, the next highest door closer size should be selected, or the closing force adjusted to a higher setting.

Data and features		TS 97
Closing force adjustable	Size	EN 2 – 4
Standard doors[1)]	up to 1100 mm	●
External doors, outward opening[1)]		–
Fire and smoke check doors[1)]		●
Non-handed		●
Arm assembly	Slide channel	●
Closing speed adjustment by valve		●
Latching action adjustment by valve		●
Dead stop unit (mechanical)		●
Delayed action		–
Backcheck		–
Hold-open		○
Weight in kg		2.5
Dimensions in mm	Length	340
	Overall depth	37
	Height	49
Door closer compliant with EN 1154		●
CE mark for construction products		●

● yes – no ○ option

[1)] In the case of particularly heavy doors and doors that have to close against wind pressure, we recommend the DORMA TS 93.

2.4 Placing on the market / Application rules

Directive (EU) No. 305/2011 applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The ITS 96 and TS 97 products require a Declaration of Performance taking consideration of /EN 1154:1996/A1:2002/AC:2006 Building hardware - Controlled door closing devices - Requirements and test methods/ and /EN 1155:1997/A1:2002/AC:2006 Building hardware - Electrically-powered hold-open devices for swing doors - Requirements and test methods/ and /EN 1158:1997/A1:2002/AC:2006 Building hardware - Door co-ordinator devices - Requirements and test methods/ for accessories for ITS 96 and CE-marking. ANSI versions are subject to the /ANSI 156.4/, /UL 228/ and /UL 10C/.

Use is governed by the respective national regulations.

2.5 Delivery status

The ITS 96 is delivered in the following 2 variants:

Dimensions (mm)	Closer EN 2-4	Packaging	Slide channel	Packaging
Length	277	340	440	531
Width	32	34	20	46
Height	42	60	12	32

Dimensions (mm)	Closer EN 3-6	Packaging	Slide channel	Packaging
Length	291	356	440	531
Width	39.5	42	20	46
Height	51	70	12	32

The TS 97 is supplied as a full package with slide channel and cushioned limit stay.

Dimensions (mm)	Closer EN 2-4	Slide channel	Packaging
Length	340	340	402
Width	37	24	192
Height	49	15.5	65

2.6 Base materials / Ancillary materials

The following shares of various materials are incurred for the door closer system and individual variants declared (excl. packaging):

Material	ITS 96 2-4	ITS 96 3-6	TS97	Decl. unit	
	in g			in g	in %
Steel	1220.86	1721.25	909.39	1298.45	53.04
Stainless steel	13.58	16.01	13.58	13.99	0.57
Grey cast iron	872.40	1013.60	902.40	896.79	36.63
Aluminium	115.24	127.87	577.44	127.15	5.19
Zinc die-cast	31.08	31.08	67.59	31.85	1.30
Brass	6.02	6.02	6.02	6.02	0.25
Polypropylene	0.89	3.79	26.29	1.92	0.08
Nitrile butadiene rubber	1.77	2.33	11.77	2.08	0.08
Polyurethane	1.18	1.64	1.18	1.26	0.05
Oil	50.00	100.00	50.00	58.41	2.39
Varnish	10	10	10	10	0.41
Total	2323.02	3033.59	2575.66	2447.92	100.00

2.7 Manufacture

A. Closer

After delivery of the unmachined housing, an initial machining process is performed at the DORMA plant in Ennepetal (milling, drilling, cutting, washing, degreasing, checking the finished blank part). This is followed by assembly of the housing components (axle, axle bearing, pressure spring, pistons, valves, oil). After inspecting the assembled housing components, the closer is painted, stippled and printed.

B. Slide channel

Delivery of the slide channel profile in Ennepetal, sawing and assembly of the slide channel components (slider, fixing pieces, screws).

Delivery of the blank lever in Ennepetal is followed by drilling, broaching, embossing and varnishing of the finished slide channel lever.

C. Packaging

- Packing the closer (grey board)
- Packing the slide channel (grey board)
- Packing the screws (PE pouch bag)

The certified Quality Management system in accordance with /DIN EN ISO 9001:2008/ ensures the high quality standard of DORMA products.

2.8 Environment and health during manufacturing

The DORMA Environmental Management system at the Ennepetal facility is certified to /DIN EN ISO 14001/; occupational health and safety is certified to /OHSAS 18001/ and Energy Management to /DIN EN ISO 50001/.

2.9 Product processing/Installation

During installation of an ITS 97 system or a TS 97, the standard safety regulations must be complied with and the provisions of the professional liability associations observed. DORMA deploys its own, specially-trained teams for installation of the product systems.

2.10 Packaging

Packaging materials	ITS 96 2-4	ITS 96 3-6	TS97	Decl. unit	
	in g			in g	in %
Polyethylene foil	11.3	11.3	4	11.15	8.25
Kraft paper, bleached	5.2	5.2	17	5.45	4.03
Corrugated board	117	131	50	117.94	87.25
Polystyrene	0	0	30	0.64	0.47
Total	133.50	147.50	101.00	135.17	100.00

2.11 Condition of use
Product maintenance is not required if used as designated.

2.12 Environment and health during use
There are no impact relations between product, environment and health during use.

2.13 Reference service life
The reference service life for the EN variants amounts to 20 years. This corresponds with approx. 50,000 closing cycles per year in relation to a total of 1,000,000 closing cycles according to DIN EN 1191.

2.14 Extraordinary effects

Fire
In accordance with /DIN EN 1154/, including Annex A, the door closers comply with the requirements on door closing devices to be used on fire and smoke check doors. Within the framework of an ift testing procedure, evidence was provided that the slide channel door closers comply with the requirements on fire protection closure achieving a fire resistance duration of E12 90 in accordance with /DIN EN 13501-2/ taking consideration of /DIN EN 14600/.

Water
Unforeseen water ingress, e.g. caused by activation of a sprinkler system or flooding, does not have any impact on the function and usability or service life of the door closer thanks to its metallurgical product features.

Mechanical destruction
In the event of mechanical destruction, all product components must be disposed of correctly, i.e. prevented from entering the sewage system or bodies of water.

2.15 Re-use phase
With reference to the material composition of the product system in accordance with section 2.6, the following possibilities arise:

Re-use
During refurbishment or de-construction, door closers can be easily segregated and re-used for the same application. The product characteristics (very long useful life without material fatigue) form a solid basis for this.

Material recycling
The metallurgical materials contained in the materials are suitable for material recycling.
Energy recovery
The plastics contained in the materials are suitable for energetic recovery.
Landfilling
The product can be landfilled without any risk to the environment or health.

2.16 Disposal
Scrap incurred during the production phase
Cuttings incurred during the manufacturing phase is directed towards metallurgical recycling and energy recovery. Cuttings are collected separately and collected by a disposal company.

- /EWC 07 02 03/ Plastic waste
- /EWC 12 01 01/ Ferrous metal filings and turnings
- /EWC 12 01 03/ Non-ferrous metal filings and turnings

Packaging
Packaging incurred for installation in the building is directed towards energy recovery.

- / EWC 15 01 01/ Paper and cardboard packaging
- / EWC 15 01 02/ Plastic packaging

End of Life
All materials are directed to an energy recovery or metallurgical recycling process.

- /EWC 13 01 07/ Other hydraulic oils
- /EWC 17 02 03/ Plastic
- /EWC 17 04 01/ Copper, bronze, brass
- /EWC 17 04 02/ Aluminium
- /EWC 17 04 05/ Iron and steel

2.17 Further information
More information on DORMA products available from:

DORMA Deutschland GmbH
Dorma Platz 1
58256 Ennepetal (Germany)
Tel.: +49 (0) 2333 / 793-0
Internet: www.dorma.com

3. LCA: Calculation rules

3.1 Declared Unit
The declared unit is one average door closer system. The average was established from the weights relating to volumes of the closer variants sold referred to in section 2.2. The mass of the declared unit is 2.45 kg/unit.
The following table depicts the mass-related information per door closer.

Details on declared unit

Name	Value	Unit
Declared unit	1	1 piece/product
Declared unit (Alternativ)	2.45	kg
Packaging material	0,14	kg/piece
Totally	2,59	kg/piece
Conversion factor to 1 kg	0.39	-

3.2 System boundary
EPD type: Cradle to gate – with options

Modules A1-A3
The product stage involves production of the requisite raw materials including all of the upstream chains as well as the requisite procurement transport. Production of the declared unit also took consideration of the requisite auxiliaries and consumables as well as their upstream chains.
Module A4

This module considers the ecological impact of transporting the declared unit from the plant gate to the construction site.

Module A5

The environmental impacts incurred during disposal of product packaging materials were taken into consideration here.

Modules C2-C4

These modules include the environmental impacts of waste treatment at the end of life and the associated transports.

Module D

The value streams arising from waste treatment (from A5, C3 and C4) which can in turn serve as energetic (refuse incineration plant route) or material input (recycling) for a downstream product system are indicated as credits here.

3.3 Estimates and assumptions

A distance of 100 km with a truck capacity utilisation of 85% was assumed for all disposal transports.

3.4 Cut-off criteria

The impact associated with neglected mass percentages accounts for less than 5% of the impact categories per module. Maximum 1% of the total mass and renewable and non-renewable primary energy is cut off.

3.5 Background data

The latest version 6.4 of the software system for comprehensive analysis (/GaBi/) was used for modelling the life cycle of the door closer systems. The entire production process was modelled using the manufacturer-specific data while generic background data sets were used for the upstream and downstream processes. All of the background data sets used were taken from the current versions of various GaBi data bases and the /ecoinvent/ data base (version 2.2). The data items contained in the data bases are documented online.

For Modules A1-A3, German (production processes in Germany) data sets were used where possible; distribution transports (A4) and disposal processes (A5, C Modules) availed of both German and the corresponding European data sets.

3.6 Data quality

Data was recorded for the products under review by way of analysing internal sales, production and environmental data, collating LCA-relevant data within the supply chain (transport distances) as well as measuring the relevant data for the provision of energy. The data surveyed has been examined for plausibility and consistency. A good level of representativity can therefore be assumed.
The background data records used for the LCA are generally no more than 10 years old.

3.7 Period under review

The LCA data was recorded during the period 01.07.2013 to 30.06.2014.

3.8 Allocation

Modules A1-A3

Production waste incurred (steel and aluminium waste) is regarded as co-products and the expenses for which they account are allocated by means of economic allocation.
The intensity associated with secondary material contained in the materials is considered in Modules A1-A3. The credits arising from recovering secondary materials from the disposal processes at the end of life are allocated to Module D.

Module A5

Thermal recycling of packaging waste incurred is analysed in Module A5 and the ensuing credits are outlined in Module D.

Modules C2-C4

End-of-life treatment to the end of the waste characteristic of the product components to be disposed of is analysed in Module C. The ensuing credits are allocated to Module D.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

Transport to the building site (A4)

The following assumptions were made for transporting the door closer:

Name	Value	Unit
Transport distance	400	km
Capacity utilisation (including empty runs)	85	%

Construction installation process (A5)

Packaging waste is incurred during installation of the door closer:

Name	Value	Unit
Waste treatment on the construction site	0,14	kg/piece

Reference Service Life

Name	Value	Unit
Reference service life	20	a

End of Life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	0.025	kg
Recycling	2.13	kg
Energy recovery (incl. landfilling residual materials)	0.69	kg

Re-use, recovery and recycling potential (D)

Metal is directed to a material recycling process while plastics and packaging materials are directed towards energetic recovery. The ensuing credits are allocated to Module D.

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 average door closer incl. packaging materials

Parameter	Unit	A1-A3	A4	A5	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	1.14E+1	4.61E-2	1.24E-1	1.37E-2	1.23E-1	3.54E-2	-4.06E+0
ODP	[kg CFC11-Eq.]	-2.76E-8	5.96E-14	1.69E-13	1.41E-14	7.05E-9	1.74E-12	7.77E-8
AP	[kg SO_2-Eq.]	3.03E-2	1.18E-4	-1.75E-5	3.31E-5	5.50E-4	1.04E-4	-1.21E-2
EP	[kg $(PO_4)^{3-}$-Eq.]	1.91E-3	3.33E-5	3.39E-6	9.23E-6	3.52E-4	1.27E-5	-5.00E-4
POCP	[kg ethene-Eq.]	4.12E-3	-3.30E-5	-3.89E-6	-1.04E-5	4.32E-5	1.15E-5	-1.88E-3
ADPE	[kg Sb-Eq.]	1.89E-4	2.49E-9	1.66E-9	5.90E-10	3.77E-7	6.53E-9	-1.20E-4
ADPF	[MJ]	1.31E+2	6.58E-1	-1.19E+0	1.57E-1	1.27E+0	4.94E-1	-4.32E+1

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: 1 average door closer incl. packaging materials

Parameter	Unit	A1-A3	A4	A5	C2	C3	C4	D
PERE	[MJ]	2.62E+1	5.04E-2	5.55E-3	1.19E-2	1.50E-1	2.93E-2	-2.74E+0
PERM	[MJ]	9.37E-2	9.20E-14	2.93E-13	2.18E-14	1.64E-2	7.69E-13	-1.37E-3
PERT	[MJ]	2.63E+1	5.04E-2	5.55E-3	1.19E-2	1.67E-1	2.93E-2	-2.74E+0
PENRE	[MJ]	1.44E+2	6.61E-1	-1.18E+0	1.57E-1	2.02E+0	5.15E-1	-4.33E+1
PENRM	[MJ]	4.66E-4	0.00E+0	0.00E+0	0.00E+0	5.13E-6	0.00E+0	2.24E-9
PENRT	[MJ]	1.44E+2	6.61E-1	-1.18E+0	1.57E-1	2.02E+0	5.15E-1	-4.33E+1
SM	[kg]	1.16E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	5.38E-6	-1.91E-6	1.28E-6	6.84E-9	3.58E-4	-4.91E-4
NRSF	[MJ]	0.00E+0	5.62E-5	-1.06E-4	1.34E-5	7.28E-8	7.54E-4	-4.31E-3
FW	[m^3]	-	-	-	-	-	-	-

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 average door closer incl. packaging materials

Parameter	Unit	A1-A3	A4	A5	C2	C3	C4	D
HWD	[kg]	1.37E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-7.10E-5
NHWD	[kg]	3.88E+1	4.43E-3	2.16E-2	1.06E-3	3.93E-4	7.58E-1	-9.81E+0
RWD	[kg]	5.70E-3	8.78E-7	2.03E-6	2.08E-7	1.71E-7	8.32E-6	-3.55E-4
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.13E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.90E-1	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	2.56E-1	0.00E+0	2.14E-2	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	6.34E-1	0.00E+0	6.71E-2	0.00E+0	0.00E+0

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

6. LCA: Interpretation

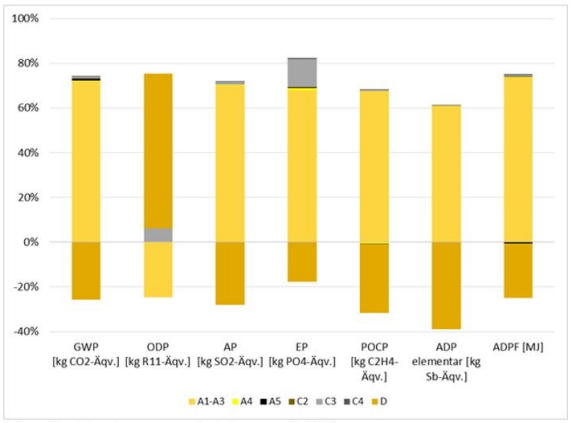

Fig. 1: Environmental impact (%)

[Legende]	[Legend]
GWP [kg CO2-Äq.]	GWP [kg CO_2 equiv.]
ODP [kg CFC11-Äq.]	ODP [kg CFC11 equiv.]
AP [kg SO2-Äq.]	AP [kg SO_2 equiv.]
EP [kg (PO4)3--Äq.]	EP [kg (PO4)3 equiv.]
POCP [kg Ethen-Äq.]	POCP [kg ethene equiv.]
ADP elementar [kg Sb-Äq.]	ADP elementary [kg Sb equiv.]
ADPF [MJ]	ADPF [MJ]

The product stage (Module A1-A3) and assumed material recycling clearly dominate proportionately and this is also reflected in the credits in Module D. The credit module is however outside the system boundaries under review and should not be explained in more detail here as an interpretation of results. The primary cause of environmental impacts is attributable to the processes of providing metal, especially grey cast iron, aluminium and steel. This result is typical for products with a high metal content (> 96%). In a cross-module analysis, the greatest levels of energy consumption are primarily to be found in the upstream chains (Modules A1-A3). High energy requirements during metal production in particular account for the most environmental pollution during the product stage. Accordingly, energy production with its resource requirements and the associated air emissions has an influence on the indicators of global warming potential (**GWP**), ozone depletion potential (**ODP**), acidification potential for soil and water (**AP**), eutrification potential (**EP**) and abiotic depletion potential fossil fuels (**ADPF**). A positive effect on environmental impact during manufacture is attributable to the use of electricity and hydropower within the DORMA plants. This is also apparent in the share of renewable primary energy used as energy carrier (**PERE**) accounting for 15.4%.

The Ozone Depletion Potential (**ODP**) is primarily attributable to R11 and R114 emissions from the upstream chain associated with the provision of electricity, with approx.7% accounted for by waste processing (Module C3) and 78% accounted for by the credit in the form of the “value of scrap”. The "value of scrap" of the international steel association "worldsteel" is a theoretical environmental profile for steel scrap. It is calculated from the difference between manufacturing primary steel (theoretical value based on the blast furnace route, no scrap input) and manufacturing secondary steel using electric arc furnaces (EAF) (100% scrap input in the EAF route). Both routes represent global production mixes. The ODP value is primarily dependent on electricity consumption and therefore power mix share accounted for by nuclear energy. In the EAF route, electrical energy is dominant as an energy carrier while the blast furnace route is based on fossil energy carriers (e.g. coal). What's more, the EAF electricity mix includes higher percentages of nuclear electricity than the blast furnace electricity mix (depending on the production country mix). This results in a negative ODP value for the "value of scrap" data set which in turn leads to an additional environmental burden in terms of scrap credits. Analog to this, the use of the “value of scrap” data set during the product stage (Modules A1-3) for analysing the environmental loads associated with steel scrap as a material used in the production of secondary steel leads to a credit.

Comments
The background data sets used do not sufficiently represent the indicator for the use of fresh water resources (**FW**). The Declaration does not therefore include any values for fresh water.

7. Requisite evidence

ITS96 2-4/ 3-6 certificates

- General construction inspection approval Approval no.: Z-6.5-189
- EC Certificate of Conformity 0432-BPR-000
- Load change 1,000,000 cycles as per /DIN EN 1191:2000-08/, /DIN EN 12400:2003-01/ and /DIN EN 14600:2006-03/, test report no. 251 31090/22.
- Certifire: CERTIFICATE OF APPROVAL No. CF 140 as per /EN 1154/, /BS 476-22/ and /EN 1634-1/

TS97 certificates

- General construction inspection approval
- Approval no.: Z-6.5-1890
- EC Certificate of Conformity 0432-CBD-0008
- Certifire: CERTIFICATE OF APPROVAL No. CF 119 as per /EN 1154/, /BS 476-22/ and /EN 1634-1/

8. References

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin(pub.):
Generation of Environmental Product Declarations (EPDs);

General principles
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04
www.bau-umwelt.de

ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804
EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Product Category Rules for Construction Products, Part A: Calculation rules for the Life Cycle Assessment and requirements on the Background Report, 2013-04

Product Category Rules for Construction Products, Part B:
Requirements on the EPD for locks and fittings, 2013-03

2001/118/EC: Commission decision dated 16 January 2001 on amending Decision 2000/532/EC on a waste directory

(EU) Directive No. 305/2011
BHMA A156.4 Door controls – Closers, 2013-05

BS 476-22 Fire tests on building materials and structures. Methods for determination of the fire resistance of non-load-bearing elements of construction, 1987-05

OHSAS 18001 Occupational health and safety management systems, Requirements, 2007-07

CEN/TR 15941 Sustainability of construction works – Environmental product declarations – Methodology for selection and use of generic data; German version CEN/TR 15941:2010; 2010-03

DIN 18040-1 Construction of accessible buildings; Design principles – Part 1: Publicly accessible buildings; 2010-10

DIN 18040-2 Construction of accessible buildings; Design principles – Part 2: Dwellings; 2011-09

DIN 18040-3 Construction of accessible buildings; Design principles – Part 3: Public circulation areas and open spaces; 2014-12

DIN EN 1154 Building hardware – Controlled door closing devices – Requirements and test methods (includes amendment A1:2002); German version EN 1154:1996 + A1:2002

DIN EN 1155 Building hardware – Electrically-powered hold-open devices for swing doors – Requirements and test methods (includes amendment A1:2002); German version EN 1155:1997 + A1:2002

DIN EN 1158 Building hardware – Door co-ordinator devices – Requirements and test methods (includes amendment A1:2002); German version EN 1158:1997 + A1:2002:2003-04

DIN EN 1191 Windows and doors – Resistance to repeated opening and closing; German version EN 1191:2000-08

DIN EN 1634-1 Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 1: Fire-resistance test for door and shutter assemblies and openable windows; German version EN 1634-1:2014; 2014-03

DIN EN 12400 Windows and pedestrian doors – Mechanical durability – Requirements and classification; German version EN 12400:2002; 2003-01

DIN EN 13501-2 Fire classification of construction products and building elements – Part 2: Classification using data from fire-resistance tests, excluding ventilation services; German version EN 13501-2:2007 + A1:2009

DIN EN 14600 Doors and openable windows with fire-resistant and/or smoke control characteristics – Requirements and classification; German version EN 14600:2005:2006-03

DIN EN ISO 9001 Quality management systems – Requirements; 2008-12

DIN EN ISO 14001 Environmental management systems – Requirements with guidance for use (ISO 14001:2004 + Cor. 1:2009); German and English versions EN ISO 14001:2004 + AC:2009

DIN EN ISO 50001 Energy management systems – Requirements with guidance for use; German version 2011-12

DIN EN ISO 14044 Environment management – Life Cycle Assessment – Requirements and Instructions (ISO 14044:2006); German and English versions EN ISO 14044:2006-10

DIN SPEC 1104 DIN Technical Report CEN/TR 15894:2009-12, Building hardware – Door fittings for use by children, elderly and disabled people in domestic and public buildings – A guide for specifiers; German version CEN/TR 15894:2009

ecoinvent Data base for life cycle analysis (life cycle inventory analysis data), version 2.2, Swiss Centre for Life Cycle Inventories, St. Gallen

Gabi 6 Software and Data Base for Life Cycle Engineering, IKP [Institute for Polymer Testing and Polymer Science], University of Stuttgart and PE Europe AG, Leinfelden-Echterdingen, 2012

UL 10C Positive pressure fire tests of door assemblies; 2009-01

UL 228 Door closers – Holders, with or without integral smoke detectors; 2006-01

Publisher
Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Programme holder
Institut Bauen und Umwelt e.V.
Panoramastr 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 – 3087748 - 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Author of the Life Cycle Assessment
brands & values GmbH
Konsul-Smidt-Str. 24
28217 Bremen
Germany

Tel +49 (0)421 460460 15
Fax +49 (0)421 460460 09
Mail info@brandsandvalues.com
Web **www.brandsandvalues.com**

Owner of the Declaration
DORMA Deutschland GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Tel +49 (0)2333 793-0
Fax +49(0)2333 793-4950
Mail dorma-deutschland@dorma.com
Web **www.dorma.com**